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TECHNICAL MEMORANDUM

FROM Jim Christiansen WAM

TO Jeff Montera, CDM-FPC Project Manager
John McGuiggin, Volpe Project Manager

SUBJECT Libby Contaminant Screening Study SAP

This memorandum discusses EPA's initial general guidance to CDM-FPC for development of the Libby Contaminant Screening Study (CSS) SAP under WA#116-RIRI 08BC and to the Volpe Center under WA#17, IAG #DW69953792-01 for implementation of the data collection. Much of this has already been discussed and may change as discussion continues and the SAP is developed.

I Overall Approach

In general, exposure to asbestos at any specific residential or small commercial property occurs when asbestos containing material is disturbed and the air it contaminates is breathed by a resident or visitor. This can occur outdoors or indoors. A draft site conceptual model is attached. For the RI, the first challenge is to efficiently find and measure the various primary and "secondary" contaminant sources of Libby amphibole asbestos which may be disturbed both indoors and outdoors at all properties in the Libby study area. "Primary" sources inherently contain high levels of amphibole asbestos and include zonalite attic insulation, vermiculite products and waste, tremolite rocks and highly contaminated soils (e.g. greater than 1% asbestos by weight). The presence of a primary source also indicates that secondary sources, which include contaminated indoor dust and outdoor soil, may also be present.

A sampling program which exhaustively measures all potential primary and secondary sources in one step (e.g. extensive indoor dust sampling, TEM analysis, and risk-based outdoor sampling) is both unnecessary and cost/time prohibitive. An alternative approach, which uses visual and verbal screening to search for obvious primary sources *and* other indicators of potential secondary sources, coupled with low detection limit presence/absence analytical techniques, is a more efficient first step. This approach will build on the experience gained over



the past few years and utilize the data constructively. Using such an approach, more acute risks can be identified and dealt with immediately, areas with no contamination can be declared 'clean' and situations in between can be earmarked for additional analysis and possible risk assessment. This approach will provide the most comprehensive "snapshot" of contamination across the Libby Valley presented to date, allowing for sound long-term project planning. Expensive indoor dust sampling, TEM analysis and other risk based investigation is left until later when the subset of properties potentially needing risk assessment is better defined and likely much smaller than today and risk assessment information has evolved.

To begin designing the RI approach, we must start with one basic assumption. For indoor dust to be contaminated with Libby amphibole asbestos at least one of the following indicators must be present:

- zonolite attic insulation (ZAI) at the property, past or present
- vermiculite building products (such as aggregate)
- past tracking in by mining related workers or others who may have been highly exposed
- current or past tracking in from contamination at the property or nearby

If *none* of those indicators is present it is unlikely that indoor dust in the property is contaminated. The RI approach is based on the assumption that it is more efficient to *conservatively* screen for the presence of these sources and indicators than to measure asbestos levels in indoor dust for every property. Therefore, for the first phase of the RI (the CSS) we will screen *all* properties for ZAI, outdoor primary source areas, outdoor secondary sources (e.g. concentrations less than 1% but above the detection limit), and other factors which may impact contamination such as a mining-related history. Again, this screen will be conducted through a combination of verbal and visual screening coupled with presence/absence analytical techniques. Properties found to have *any* one such primary source or indicator will either be automatically earmarked for cleanup (e.g. sufficient justification already exists for cleaning up ZAI and outdoor source areas) or earmarked for additional analysis to evaluate risk presented by secondary sources. In some cases, it may be more cost effective and efficient to assume unacceptable secondary source contamination as opposed to performing additional analysis which may be very costly.

II Contaminant Screening Steps

The following definitions will be used throughout this document and should be carried forth to the SAP:

Primary Source Material = vermiculite products, vermiculite mining waste, soils >1%

Secondary Source = contaminated indoor dust or outdoor soil (for outdoor soil generally <1%)

Use Area = defined specific use area such as driveway, flower bed, etc.

Zone = general portion of a yard

The following screening questions were reviewed by the Libby Site Team and should be incorporated into the SAP:

Qualitative/Visual Information

- 1 Does the interior have ZAI? Did the interior ever have ZAI? (Questions visual inspection age of home)
- 2 Are their vermiculite additives in building materials?(Questions, visual inspection, age of home)
- 3 Is there any evidence of primary source materials *on* the property? (Questions visual inspection age of home)
- 4 Is there any evidence of primary source materials/areas *near* the property? Could this have been tracked in or otherwise spread indoors? (Questions data for nearby properties proximity to known source areas/downtown visual inspection)
- 5 Is there any reliable knowledge of former miners or close relatives of miners living in the property? Any other knowledge of persons routinely entering the property who may have been highly exposed? (Questions, visual inspection of home age of home)
- 6 Is the resident diagnosed with asbestos related disease? Any other reason to believe the property may be impacted either interior (e.g. vermiculite in potted plants) or exterior? (Questions field judgement, err on the side of caution)

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Quantitative/Analytical Information

- 7 Is Libby asbestos present at greater than 1% in composite soil samples of zones within yard when analyzed by IR/SEM? (i.e. is there a primary source material or "hot spot"?)
- 8 Is Libby asbestos present at 1% percent in composite soil samples of use areas around property when analyzed by IR/SEM? (i.e. is there a primary source material or "hot spot"?)
- 9 Is Libby asbestos present above detection limit (0.1- 1%) in composite soil samples of zones within yard when analyzed by IR/SEM? (i.e. is outdoor soil a secondary source?)
- 10 Is Libby asbestos present above detection limit (0.1- 1%) in composite soil samples of use areas around property when analyzed by IR/SEM? (i.e. is there a secondary source?)

III Possible outcomes of the CSS with likely action steps and issues

Possible outcomes of the CSS (and likely cleanup decisions) are described below. This will help with preparation of DQO's. The issues presented need not be answered now, but should be brought out in the SAP as possible future decision points. It is recognized that there may also be unique circumstances not considered here and that remediation decisions for each property may be different. *The flow chart I previously provided remains unchanged except for the need to add a specific path for 1 below*

a Property with zonolite (past or present) which has source materials outdoors and other areas of detectable asbestos outdoors

No further indoor sampling. Clean up zonolite, interior, and source materials. Need to decide whether to clean up other areas of the yard with detectable asbestos away from the source area or to perform additional risk assessment and/or sampling (i.e. is it cheaper/more efficient/more protective of interior cleanup remedy to clean up yard all at once now or to decide later based on sample results and risk assessment?)

b Property with zonolite which has source materials outdoors but no other areas of detectable asbestos outdoors

No further sampling or risk assessment Clean up zonolite, interior, and source materials

c Property with zonolite which has no source materials outdoors but does have other areas of detectable asbestos outdoors

No further indoor sampling Clean up zonolite and interior Need to decide whether to clean up other areas of the yard with detectable asbestos or to perform additional risk assessment and/or sampling (i.e. is it cheaper/more efficient/more protective of interior cleanup remedy to clean up yard now or to decide later based on sample results and risk assessment?)

d Property with zonolite which has no detectable asbestos outdoors

No further sampling or risk assessment Clean up zonolite and interior

e Property without zonolite which has source materials outdoors and other areas of detectable asbestos outdoors

Clean up source materials Need to decide whether to clean up interior now or do additional indoor dust sampling and risk assessment and decide later (i.e. which is more efficient?) Also need to decide whether to clean up other areas of the yard with detectable asbestos or to perform additional risk assessment and/or sampling (i.e. is it cheaper/more efficient/more protective of interior cleanup remedy to clean up yard now or to decide later based on sample results and risk assessment?)

f Property without zonolite which has source materials outdoors but no other areas of detectable asbestos outdoors

Clean up source materials Need to decide whether to clean up interior now or do additional indoor dust sampling and risk assessment and decide later (i.e. which is more efficient?)

g Property without zonolite which has no source materials outdoors but does have other areas of detectable asbestos outdoors

Need to decide whether to clean up interior now or do additional indoor dust sampling and risk assessment and decide later (i.e. which is more efficient?) Perform additional risk assessment and sampling to decide whether to clean up yard

h Property without zonolite, no detectable asbestos outdoors, but does have mining history or other reason to believe indoor dust may be contaminated

Need to decide whether to clean up interior now or do additional indoor dust sampling and risk assessment and decide later (i.e. which is more efficient?)

i Property without zonolite which has no detectable asbestos outdoors and no mining

history or other reason to believe indoor dust may be contaminated

No further sampling No action

j Properties with vermiculite additives in building materials will be evaluated on a case by case basis

IV Qualitative Screening Approach

The qualitative screen for each property will be slightly different. It will not be as simple as using a questionnaire or check list and filling in the blanks. The objective for the field teams will be to ask the right questions and perform the right inspections to be able to confidently answer the questions laid out in II above, often a properties with multiple structures. While a check list should be developed (based on or the same one used by removal) to ensure all possible angles are covered, this does not mean ask only those questions verbatim. It does mean tailoring the questions to the specific person you are interviewing. It does mean engaging the property owner for an in-depth discussion, if possible. It does mean using sound field judgement and being well-trained to recognize vermiculite sources. It does mean thoroughly recording HOW and WHY the field team arrived at their answer and good field notes. In other words, we've made the decision tree in III as simple as possible, but the information that goes into that decision tree is somewhat complex and must be treated as such.

My intent is to add simple fields for answers to the ten screening questions in II to the Libby database, but not add every answer/all information obtained in the screen to the database. Field notes will be particularly important here. For instance, if the answer to a question is yes, the database will only tell us that much, but we should be able to cross reference field notes to determine exactly why the answer was given and/or how the sample was collected.

During screening, I would like to disseminate a "What do I do if I find something that looks like this?" booklet or fact sheet to all property owners or tenants. This will assist us in screening the properties and will help form the basis of a long-term operations and management (O&M) plan for future discoveries of vermiculite products after EPA cleanup is complete. I've asked Wendy Thom to work with Karen Ekstrom of CDM to begin work on this.

V Quantitative (Soil Sampling) Approach

Intent

The primary intent of soil sampling is to verify the presence or absence of Libby amphibole asbestos in areas of the property which are most likely to be disturbed.

Number and Locations of Samples

Property exteriors should be divided into all applicable use areas (all gardens, dirt driveways, etc) and a number of zones, based on the size of the yard. In general, a composite sample (no greater than 5 individual samples, but possibly less depending on area) should be

collected from each use area and each zone though judgement should be used in sampling approach and number of samples. For instance, very new homes (built after 1990) far from the core of Libby may require fewer samples, while older homes in the downtown areas may require more. Similarly, changes the field sampling approach may be made as data is available. At individual properties, areas closer to the home or in high traffic areas should be given priority - this is most likely to be disturbed or tracked into the indoors. Also, a number of 'non-standard opportunity samples should be allotted for the effort specific to areas where we have reason to believe such a sample may provide information (for instance the homeowner stated they used vermiculite as a fill for an underground utility or for planting trees). Thus, the number of samples per property may vary but a standard per property approach can be developed. It is envisioned that no more than five and no less than two samples per property will be needed. Use of field judgement is imperative as is recording the thought process used for each property. Also it is unnecessary to sample and analyze areas where primary sources are identified via visual inspection.

Sample Depth

Sampling in "use areas" (where vermiculite products may have been deposited and more regular activity at depth occurs) should occur over the 0-6' interval. Sampling in zones of the yard (where it is unlikely that vermiculite products were used and most disturbance is confined to the surface) should occur only at the 0-1" interval. It should be acknowledged in the SAP that this approach seeks to characterize areas where exposure is *most* likely. Using this approach some areas of asbestos (for instance at depth in a portion of the yard where it was used as backfill) may be missed. Due to the unique nature of how this material was deposited (often manually in specific areas, as opposed to smelter aerial deposition or through runoff) it is simply impossible to look for every fiber, everywhere especially at depth. As mentioned previously an O&M plan will be devised in the future to deal with situations where asbestos is encountered in unexpected or uninvestigated areas such as at depth.

Unique Situations

We will obviously encounter complex properties or situations. When these are encountered, a property specific sampling approach may be required. A memorandum should be prepared to discuss any significant deviations to the SAP.

VI Analytical Methods

Analysis will be done with a combination of SEM and IR. The bulk of samples will be analyzed using IR (assuming a detection limit of 1% asbestos by weight) with a subset of samples analyzed by SEM (assuming a detection limit of at least 1% by weight but hopefully 0.1%). I recommend a ratio of 3:1, with at least one "zone" sample from each property analyzed by SEM. This will help investigate if a pattern of low level diffuse contamination (aerial deposition?) exists across the study area.

At times we may elect to take indoor air samples. These samples will be collected in accordance with the existing SAP. The CSS SAP should discuss this possibility and reference the appropriate SAP.

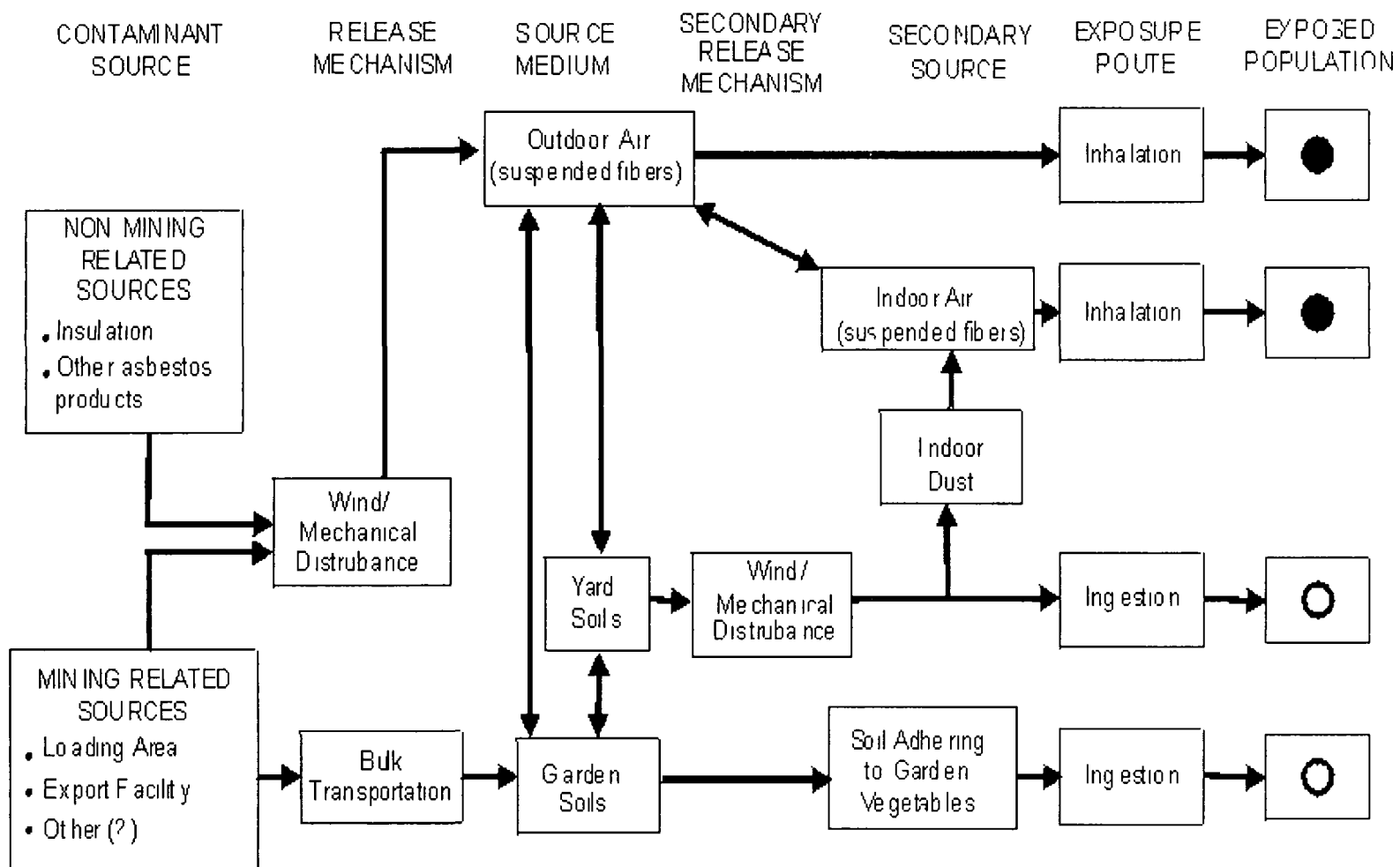


Figure 1 Draft Conceptual Site Model - Potential Human Exposure Pathways to Asbestos at the Libby, Montana Site

- = Pathway is complete, but minor, qualitative evaluation
- = Pathway is complete and could be significant; quantitative evaluation

VII Data Collection Effort

Screening should start from the two opposite ends of the contamination spectrum. Some screening teams should start in the areas where contamination is most expected (e.g. older homes, downtown, etc.). Some should start in areas where contamination is not expected (e.g. newer homes, away from downtown, etc.). I would also like a team to be prepared to respond to specific requests, such as priority screening for property owners involved in a transaction or other special circumstances.

From the database, we should be able to answer the "screen" for all properties in Libby not already cleaned up, including those already sampled by removal. This will entail ensuring we have the information we need for previously sampled properties. Soil samples for these properties previously analyzed via PLM which registered either trace or ND should also be re-analyzed. This should occur first.

The vast majority of the properties should be screened this calendar year. This will entail several field crews working simultaneously.

Due to the large number of properties, a personal meeting with everyone to discuss results is unfeasible. If this is requested or deemed necessary, it will be arranged. However, the standard approach will be to mail 'raw' results with stand-alone explanations and contact numbers.

VIII QA/QC

To be discussed 3/26/02

Who
Does
This?
S? Karen Ekstrom??
+
1 other on-site person